#19

RAW SEQUENCE LISTING DATE: 04/25/2003
PATENT APPLICATION: **US/09/596,958A** TIME: 14:44:32

Input Set : **A:\C32861.app**
Output Set: **N:\CRF4\04252003\I596958A.raw**

<110> APPLICANT: Kim, Jihyun Francis
Beer, Steven V.
<120> TITLE OF INVENTION: HYPERSENSITIVE RESPONSE ELICITOR FROM ERWINIA AMYLOVORA AND ITS USE
<130> FILE REFERENCE: 19603/3286
<140> CURRENT APPLICATION NUMBER: 09/596,958A
<141> CURRENT FILING DATE: 2000-06-20
<150> PRIOR APPLICATION NUMBER: 09/120,927
<151> PRIOR FILING DATE: 1998-07-22
<150> PRIOR APPLICATION NUMBER: 60/055,108
<151> PRIOR FILING DATE: 1997-08-06
<160> NUMBER OF SEQ ID NOS: 10
<170> SOFTWARE: PatentIn Ver. 2.1
<210> SEQ ID NO: 1
<211> LENGTH: 1344
<212> TYPE: DNA
<213> ORGANISM: Erwinia amylovora
<400> SEQUENCE: 1

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ENTERED

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cggcaaacca ttgagcaaat ggctcaatta ttggcggaac tgttaaagtc actgctatcg 180
ccacaatcag gtaatgcggc aaccggagcc ggtggcaatg accagactac aggagttggt 240
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<210> SEQ ID NO: 2
<211> LENGTH: 447

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Input Set : **A:\C32861.app**
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<212> TYPE: PRT
<213> ORGANISM: Erwinia amylovora
<400> SEQUENCE: 2

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Phe Gln Ser Gly Gly Asp Asn Gly Leu Gly Gly His Asn Ala Asn Ser
            20                  25                  30
Ala Leu Gly Gln Gln Pro Ile Asp Arg Gln Thr Ile Glu Gln Met Ala
        35                  40                  45
Gln Leu Leu Ala Glu Leu Leu Lys Ser Leu Leu Ser Pro Gln Ser Gly
    50                  55                  60
Asn Ala Ala Thr Gly Ala Gly Gly Asn Asp Gln Thr Thr Gly Val Gly
65                  70                  75                  80
Asn Ala Gly Gly Leu Asn Gly Arg Lys Gly Thr Ala Gly Thr Thr Pro
                85                  90                  95
Gln Ser Asp Ser Gln Asn Met Leu Ser Glu Met Gly Asn Asn Gly Leu
            100                 105                 110
Asp Gln Ala Ile Thr Pro Asp Gly Gln Gly Gly Gly Gln Ile Gly Asp
        115                 120                 125
Asn Pro Leu Leu Lys Ala Met Leu Lys Leu Ile Ala Arg Met Met Asp
    130                 135                 140
Gly Gln Ser Asp Gln Phe Gly Gln Pro Gly Thr Gly Asn Asn Ser Ala
145                 150                 155                 160
Ser Ser Gly Thr Ser Ser Ser Gly Gly Ser Pro Phe Asn Asp Leu Ser
                165                 170                 175
Gly Gly Lys Ala Pro Ser Gly Asn Ser Pro Ser Gly Asn Tyr Ser Pro
            180                 185                 190
Val Ser Thr Phe Ser Pro Pro Ser Thr Pro Thr Ser Pro Thr Ser Pro
        195                 200                 205
Leu Asp Phe Pro Ser Ser Pro Thr Lys Ala Ala Gly Gly Ser Thr Pro
    210                 215                 220
Val Thr Asp His Pro Asp Pro Val Gly Ser Ala Gly Ile Gly Ala Gly
225                 230                 235                 240
Asn Ser Val Ala Phe Thr Ser Ala Gly Ala Asn Gln Thr Val Leu His
                245                 250                 255
Asp Thr Ile Thr Val Lys Ala Gly Gln Val Phe Asp Gly Lys Gly Gln
            260                 265                 270
Thr Phe Thr Ala Gly Ser Glu Leu Gly Asp Gly Gly Gln Ser Glu Asn
        275                 280                 285
Gln Lys Pro Leu Phe Ile Leu Glu Asp Gly Ala Ser Leu Lys Asn Val
    290                 295                 300
Thr Met Gly Asp Asp Gly Ala Asp Gly Ile His Leu Tyr Gly Asp Ala
305                 310                 315                 320
Lys Ile Asp Asn Leu His Val Thr Asn Val Gly Glu Asp Ala Ile Thr
                325                 330                 335
Val Lys Pro Asn Ser Ala Gly Lys Lys Ser His Val Glu Ile Thr Asn
            340                 345                 350
Ser Ser Phe Glu His Ala Ser Asp Lys Ile Leu Gln Leu Asn Ala Asp
        355                 360                 365
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PATENT APPLICATION: **US/09/596,958A** TIME: 14:44:33

Input Set : **A:\C32861.app**
Output Set: **N:\CRF4\04252003\I596958A.raw**

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130 Thr Asn Leu Ser Val Asp Asn Val Lys Ala Lys Asp Phe Gly Thr Phe
131     370                 375                 380
133 Val Arg Thr Asn Gly Gly Gln Gln Gly Asn Trp Asp Leu Asn Leu Ser
134 385                 390                 395                 400
136 His Ile Ser Ala Glu Asp Gly Lys Phe Ser Phe Val Lys Ser Asp Ser
137                 405                 410                 415
139 Glu Gly Leu Asn Val Asn Thr Ser Asp Ile Ser Leu Gly Asp Val Glu
140             420                 425                 430
142 Asn His Tyr Lys Val Pro Met Ser Ala Asn Leu Lys Val Ala Glu
143         435                 440                 445
146 <210> SEQ ID NO: 3
147 <211> LENGTH: 31
148 <212> TYPE: DNA
149 <213> ORGANISM: Erwinia amylovora
151 <220> FEATURE:
152 <221> NAME/KEY: unsure
153 <222> LOCATION: (8)
154 <223> OTHER INFORMATION: n at any position is unknown
156 <400> SEQUENCE: 3
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161 <211> LENGTH: 242
162 <212> TYPE: PRT
163 <213> ORGANISM: Fusarium solani f. sp. pisi
165 <400> SEQUENCE: 4
166 Met Lys Phe Thr Ala Ala Phe Val Ala Ala Leu Val Gly Thr Ser Ser
167   1               5                  10                  15
169 Ala Ala Val Thr Lys Thr Leu Pro Lys Ser Ala Gly Ala Thr Ser Phe
170             20                  25                  30
172 Pro Thr Ala Val Pro Val Lys Gly Ser Tyr Asp Gly Gly Met Lys Arg
173         35                  40                  45
175 Phe Glu Arg Glu Pro Lys Val Cys Lys Gly Gln Asp Glu Thr Gly Glu
176     50                  55                  60
178 Lys Asp Ala Met Phe Ile Leu Glu Asn Gly Ala Thr Leu Ser Asn Val
179 65                  70                  75                  80
181 Ile Ile Gly Ala Ser Gln Ala Glu Gly Val His Cys Lys Gly Thr Cys
182                 85                  90                  95
184 Thr Leu Asn Asn Val Trp Trp Ala Asp Val Cys Glu Asp Ala Val Thr
185             100                 105                 110
187 Leu Lys Gln Thr Ser Gly Thr Ser Tyr Ile Asn Gly Gly Gly Ala Phe
188         115                 120                 125
190 His Ala Ser Asp Lys Ile Ile Gln Phe Asn Gly Arg Gly Thr Val His
191     130                 135                 140
193 Val Lys Asp Phe Tyr Ala Glu Asp Tyr Gly Lys Leu Ser Arg Ser Cys
194 145                 150                 155                 160
196 Gly Asn Cys Lys Asp Asn Gly Gly Pro Arg Asn Val Ile Val Glu Asn
197                 165                 170                 175
199 Ser Val Ala Val Asp Gly Gly Val Leu Cys Gly Ile Asn Thr Asn Tyr
200             180                 185                 190
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```
202 Gly Asp Thr Cys Lys Val Ile Asn Ser Cys Gln Asp Lys Gly Lys Tyr
203         195                 200                 205
205 Cys Asp Arg Tyr Glu Gly Asn Ser Ser Gly Lys Glu Pro Thr Lys Ile
206     210                 215                 220
208 Gly Ser Gly Pro Asp Gly Lys Tyr Cys Thr Val Thr Gly Ser Thr Thr
209 225                 230                 235                 240
211 Ser Cys
215 <210> SEQ ID NO: 5
216 <211> LENGTH: 244
217 <212> TYPE: PRT
218 <213> ORGANISM: Fusarium solani f. sp. pisi
220 <400> SEQUENCE: 5
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222   1               5                  10                  15
224 Ala Val Thr Thr Val Leu Pro Ala Ser Ala Gly Val Gln Ser Glu Pro
225              20                  25                  30
227 Thr Ala Ile Pro Val Arg Lys Gly Asp Lys Tyr Asn Gly Gly Met Lys
228          35                  40                  45
230 Arg Phe Val Arg Asn Pro Thr Thr Cys Lys Asp Gln Tyr Glu Thr Gly
231      50                  55                  60
233 Glu Lys Asp Ala Ser Phe Ile Leu Glu Asp Gly Ala Thr Leu Ser Asn
234  65                  70                  75                  80
236 Val Ile Ile Asp Arg Ser Ser Gly Glu Gly Val His Cys Lys Gly Thr
237                  85                  90                  95
239 Cys Thr Leu Asn Asn Val Trp Trp Ala Asp Val Cys Glu Asp Ala Ala
240              100                 105                 110
242 Thr Phe Lys Gln Lys Ser Gly Thr Ser Thr Ile Asn Gly Gly Gly Ala
243          115                 120                 125
245 Phe Ser Ala Gln Asp Lys Val Leu Gln Phe Asn Gly Arg Gly Thr Leu
246      130                 135                 140
248 Asn Val Asn Asp Phe Tyr Val Gln Asp Tyr Gly Lys Leu Val Arg Asn
249 145                 150                 155                 160
251 Cys Gly Asn Cys Glu Gly Asn Gly Gly Pro Arg Asn Ile Asn Ile Lys
252                 165                 170                 175
254 Gly Val Val Ala Lys Asn Gly Gly Glu Leu Cys Gly Val Asn His Asn
255             180                 185                 190
257 Tyr Gly Asp Val Cys Thr Ile Thr Asp Ser Cys Gln Asn Lys Gly Lys
258         195                 200                 205
260 Ser Cys Gln Ala Tyr Thr Gly Asn Asp Gln Lys Lys Glu Pro Pro Lys
261     210                 215                 220
263 Phe Gly Pro Ala Gly Asp Asn Gly Lys Ser Cys Leu Val Lys Ser Leu
264 225                 230                 235                 240
266 Arg Thr Asn Cys
270 <210> SEQ ID NO: 6
271 <211> LENGTH: 215
272 <212> TYPE: PRT
273 <213> ORGANISM: Fusarium solani f. sp. pisi
275 <400> SEQUENCE: 6
276 Met Ala Cys Leu Gly Tyr Thr Gly Gly Val Pro Lys Pro Thr Asp His
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RAW SEQUENCE LISTING DATE: 04/25/2003
PATENT APPLICATION: **US/09/596,958A** TIME: 14:44:33

Input Set : **A:\C32861.app**
Output Set: **N:\CRF4\04252003\I596958A.raw**

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277   1               5                  10                  15
279 Ile Ser Asn Ser Lys Val Ile Glu Val Lys Ala Gly Gln Val Tyr Asp
280              20                  25                  30
282 Gly Lys Trp Ala Lys Tyr Asp Arg Gly Ser Gly Ala Cys Lys Gly Gln
283          35                  40                  45
285 Asn Glu Gly Gly Asp Lys Asp Ala Val Phe Leu Leu His Glu Gly Ala
286      50                  55                  60
288 Thr Leu Lys Asn Val Ile Ile Gly Lys Asp Gln Ser Glu Gly Val His
289  65                  70                  75                  80
291 Cys Lys Gly His Cys Thr Leu Glu Phe Val Trp Phe Glu Asp Val Cys
292                  85                  90                  95
294 Glu Asp Ala Ile Ser Ile Ala Gly Lys Glu Ser Trp Ile Ile Gly Gly
295              100                 105                 110
297 Gly Ala Tyr His Ala Ser Asp Lys Val Val Gln His Asn Gly Cys Gly
298          115                 120                 125
300 Thr Val Asn Ile Ile Asn Phe Tyr Val Glu Asp Tyr Gly Lys Leu Tyr
301      130                 135                 140
303 Arg Ser Cys Gly Asn Cys Ser Lys Gln Cys Lys Arg Asn Val Tyr Ile
304 145                 150                 155                 160
306 Glu Gly Val Thr Ala Lys Asn Gly Gly Glu Leu Ala Gly Ile Asn Ala
307                 165                 170                 175
309 Asn Tyr Gly Asp Thr Ala Thr Leu Lys Asn Val Cys Ala Asp Ala Lys
310              180                 185                 190
312 Gln Lys Cys Thr Met Tyr Asn Gly Cys Ala Gly Gly Cys Glu Pro Lys
313          195                 200                 205
315 Lys Ile Gly Ala Cys Pro Ala
316      210                 215
319 <210> SEQ ID NO: 7
320 <211> LENGTH: 217
321 <212> TYPE: PRT
322 <213> ORGANISM: Fusarium solani f. sp. pisi
324 <400> SEQUENCE: 7
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326   1               5                  10                  15
328 Lys Ser Leu Ser Ala Pro Lys Thr Leu Lys Lys Gly Glu Val Phe Asp
329              20                  25                  30
331 Ala Gly Trp Val Arg Tyr Asp Arg Gly Val Lys Cys Ser Gly Gln Ala
332          35                  40                  45
334 Glu Gly Gly Ser Lys Asp Ala Val Phe Ile Leu Glu Glu Gly Ala Thr
335      50                  55                  60
337 Leu Arg Asn Val Ile Ile Gly Ala Asn Gln Arg Glu Gly Ile His Cys
338  65                  70                  75                  80
340 Lys Gly Ser Cys Asn Ile Glu Phe Ala Trp Phe Glu Asp Val Cys Glu
341                  85                  90                  95
343 Asp Ala Ile Ser Ile Leu Gly Ser Gly Thr Ala Asn Ile Ile Gly Gly
344              100                 105                 110
346 Gly Ala Tyr His Ala Ser Asp Lys Val Ile Gln His Asn Gly Cys Gly
347          115                 120                 125
349 His Val Asn Ile Val Asn Phe Tyr Ala Asn Asp Tyr Gly Lys Val Tyr
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RAW SEQUENCE LISTING ERROR SUMMARY DATE: 04/25/2003
PATENT APPLICATION: **US/09/596,958A** TIME: 14:44:34

Input Set : **A:\C32861.app**
Output Set: **N:\CRF4\04252003\I596958A.raw**

Please Note:
Use of n and/or Xaa have been detected in the Sequence Listing. Please review the Sequence Listing to ensure that a corresponding explanation is presented in the <220> to <223> fields of each sequence which presents at least one n or Xaa.

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Seq#:10; Xaa Pos. 3,5,6,7,9,10,11,13,14,19,20,24,25,26,27,29,31,32,33,34,36
Seq#:10; Xaa Pos. 39,41,47,60,64,65,66,67,74,76,78,93,94,95,96,97,100,101
Seq#:10; Xaa Pos. 102,105,106,107,109,114,123,126,128,129,130,133,134,135
Seq#:10; Xaa Pos. 136,139,140,146,153,154,156,158,159,161,163,165,166,167
Seq#:10; Xaa Pos. 170,171,173,174,175,176,177,178,182,184,186,193,195,196
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